

## Universities' Attractiveness and Grading Policies: A Spatial Competition Model

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### **Abstract**

*This article compares two different views about universities' attractiveness and grading policies. On the one side, inflating grades should be a suitable strategy in order to attract students to a certain university. On the other side, soft grading policies damage departments' reputation, so discouraging students' applications. From this perspective, students are really interested in the quality of courses and the socio-economic characteristics of the territories in which universities are settled. We propose a spatial competition model, showing that grading inflation is a reaction to adverse conditions, aimed at balancing the distortions generated by fees level and differences in the socio-economic characteristics of the locations.*

**Keywords:** Higher Education; Students' choices; Grading Policies; Spatial Competition.

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## **1. Introduction**

The main aim of this article is to show how a simple spatial competition theoretical model could describe the relationship between universities' attractiveness and grading policies more efficiently than how the existing economic literature actually does. Indeed, the idea that students benefit from higher grades is in place from decades. As an example, Juola (1979) showed how American universities used to "quiet down" the student bodies' protests caused by the Vietnam War increasing grades artificially.

Without regard to underlying reasons, such a strategy would cause anyway student attainment of higher grades independent of increased levels of academic attainment (Eiszler, 2002). Consequently, the idea that students would be straightforwardly attracted by the so-called *soft grading policies* implies that they are so myopic to desire a policy which would make them less prepared, with less valuable degrees and less sortable in the job market (Lombardi and Ghellini, 2019). There are studies which try to debunk this kind of a commonplace, such as Marsh and Roche (2000), who find a positive relationship between teaching evaluations and student workload. Analyzing the existing literature, Boretz (2004) highlights that students really want their fees to be worth, but in the sense that this money has to be devoted in challenging them and increasing their competencies. On the other side, she defines the idea that students want to buy easy As just as *student consumerism*, namely the idea that universities are businesses which have to sell their good at the largest audience as possible.

Nonetheless, in the next section we will show how there is still a large stream of literature (especially in Economics) in which this misconception acritically holds. At the same time, we will present a list of empirical studies whose data seem to contradict this viewpoint. Then, we develop a simple theoretical model aiming to demonstrate that it would be sufficient to allow universities to compete interacting each other – so maintaining a conservative approach in modelling them similarly to firms selling a product – to obtain as a result that students are in many cases discouraged from choosing a university engaged in soft grading policies. Finally, we will conclude with a discussion of model result, its possible policy implication and some hints about further developments.

## **2. Soft Grading Policies: Comparing Different Perspectives**

One of the first attempts of giving a formal modelling of Grade Inflation is McKenzie (1975), where the main assumption is that rational students would experiment a trade-off between grades and leisure time, aiming at maximizing their grades constrained to the time available. Nonetheless, even if his model highlights a possible distortive effect generated by soft grading policies, he is persuaded that in reality students are very much interested in the quality of their education itself. One of the paper testing this assumption is Bratti and Staffolani (2013): even if grades' elasticities can negatively influence study time allocation,

in general students are active players in the learning process, highly responsive to changes in their workload.

Nevertheless, many following attempts to model the relationship between students' preferences and grading exhibited a more simplistic approach. As an example, Jewell *et al.* (2013) build the departments' production function generating a teaching output, which positively depends on the number of students, which positively depends by the level of grading. A possible explanation for this assumption – beyond the trivial idea that students would like to obtain high grades without effort – can be found in Chan *et al.* (2007) and Ostrovsky and Schwarz (2010). In this case, inflating grades could be a strategy played by departments themselves in order to blend mediocre students into the good ones when their abilities are signaled to the job market through the degree's final mark. Unfortunately, it is sufficient to add a reputational cost to the model to show that, when employers learn that students' ability does not match with grades, they start to penalize students from those departments. Then, students will learn that inflating-grades departments are not able to place them on the labor market, starting to avoid them (Ehlers and Schwager, 2016).

While there are evidences that teachers can “buy” good evaluations inflating grades – namely, students positively rewards high grades when they are already involved into a certain education process – (Nelson and Lynch, 1984; McPherson *et al.*, 2009; Weinberg *et al.*, 2010) very little evidences are available about the attractive power of soft grading policies when students have to decide where to apply. Some literature suggests that departments exist which employ soft grading as a suitable tool in order to attract a larger number of students, but with conflicting effects. Higher grades are provided by those departments experiencing a low enrolments' rate, but with the unintended consequence not only of generating overeducated students with lower wages and higher chances of remaining unemployed (Bagues *et al.*, 2006, 2008), but also losing their own reputation (De Paola, 2008).

Accordingly, several empirical studies are able to show how the main driver of students' choice of university is to be searched in the local socio-economic characteristics of origin and destination, especially in terms of labor market conditions (Croce and Ghignoni, 2011; D'Agostino *et al.*, 2019). Students want to anticipate the job market, moving soon towards those places able to give them better chances of being collocatated on a suitable employment, in many cases facing several ‘settling costs’ from economic, psychological, and social points of view (D'Agostino *et al.*, 2021). They seem also very interested in the competencies they are going to acquire, showing high selectivity in their choice of the educational curricula (Columbu *et al.*, 2021) Thus, students are not attracted by departments providing on average a higher level of grades. If any effect emerges, it is only in comparison with particularly low levels of average grading (Lombardi and Ghellini, 2019). At the same time, departments try to employ such a strategy only when they are facing low enrolments rate, interacting in

competition with other departments stronger in terms of educational offer and/or socio-economic local characteristics (Lombardi and Distaso, 2021).

### **3. Theoretical Model**

We develop a model in which two universities compete *a la Hotelling* with fixed positions (Hotelling, 1929). To keep the model simple, the two universities provide just one same subject. In this setting we assume that students are uniformly distributed along a segment on whose extremes are located the two universities. The segment is represented by the linear space  $[0,1]$ . The two universities are differentiated along several dimensions. The first difference is the location. *Ceteris paribus* students prefer the closer university, in fact, they pay a transportation cost called shoe-leather cost that is proportional to the distance between them and the university. For the student located in  $x$ , the shoe-leather cost of attending university  $I_i \in [0,1]$  is equal to  $\tau|I_i-x|$ . We assume that the two locations have differences in socio-economic characteristics such as unemployment rate and GDP that can be represented with the parameter  $\Delta$ . Universities have no control over these socio-economic characteristics but nevertheless students have a preference for the university located in the place that guarantees better opportunities. Without loss of generality we assume that the university located in 0 has the worst socio-economic characteristics. A second level of differentiation between universities are the fees that are the only source of financing for universities. From the standpoint of students low fees are preferable. In fact, we assume that fees are not signals of the quality of a university, and thus only the monetary side matters. For universities both the price and quantity effects are at work. Increasing the fees generate a greater revenue per student, but decreases the number of students attending the university. We note that in this setting it is not the absolute value of the fees that matters, but the relative value of the two universities' fees. The last source of heterogeneity between universities is the grading policy which is represented through the parameter  $G$ . We assume in this theoretical section that students are attracted by the possibility of obtaining high grades with low effort, thus preferring universities characterized by high values of  $G$ . Again the standpoint of universities is more complex. In fact, two mechanisms similar to the quantity and price effect are at work for the grading policy. As we argue before, a greater value of  $G$  increases the attractiveness of the university, and thus it increases the number of students and the quantity of fees collected. In addition to this positive effect of grading policy there is a negative one, that concerns to the dimension of reputation of the university. The increase of grades has not a direct financial effect on the university, but it has a negative effect on job market. In fact, grading policies perturb and distort the signal of the quality of students harming the efficiency of the job market. Universities are blamed for this negative externality generating a reputation cost. We assume that the reputation cost depends both on the magnitude of the grading policy and on the quantity of students that are subject to it. Indeed, the effect on the job market is

proportional to the number of graduates with artificially high grades. We further assume that the quality of the two universities in terms of teachers, services, and quality of the research is the same, and thus the utility, in terms of knowledge, that students get from attending the two universities is the same, label it with  $r$ .

Each student has to attend one of the two universities and thus the choice is determined by the comparison of the total utility obtained attending the university in 0,  $U_0$ , and the university in 1,  $U_1$ . The only difference between students is their location it is the only characteristic through which is possible to discriminate between students attending one university or the other. The utility of attending university  $i$  (that can be either 0 or 1) of a student located in  $x$  (with  $0 \leq x \leq l$ ) is:

$$U_i = r - \tau|l_i - x| + aG_i \pm b\Delta - f_i$$

Where  $a$  is the propention to appreciate high grades of students and  $b$  is the importance for students to attend the university in the wealthier location. The sign in front of  $b\Delta$  is positive for the university located in 1 and negative otherwise. The indifferent student is the one that obtains the same utility from attending the two universities:

$$\hat{x} = \frac{1}{2} - \frac{a}{2\tau}(G_1 - G_0) - \frac{b\Delta}{t} - \frac{1}{2\tau}(f_0 - f_1)$$

Students located on the left of  $\hat{x}$  prefer the university in 0 and students on the right prefer the university in 1. The objective of universities is to maximize total fees net of the reputational cost due to the grading policy. We assume that fees are fixed, at least in the short term, and thus the only instrument to increase revenues is the grading policy. The maximization problems for the two universities are respectively:

$$\max_{G_0}(f_0 - G_0) \hat{x} \quad \text{and} \quad \max_{G_1}(f_1 - G_1) (1 - \hat{x})$$

Solving the to maximization problems separated we initially obtain the optimal grading policy for each university given the grading policy chosen by the other one.

$$\begin{cases} G_0(G_1) = \frac{G_1}{2} + \frac{(a+1)f_0 - f_1 + 2b\Delta - \tau}{2a} \\ G_1(G_0) = \frac{G_0}{2} + \frac{(a+1)f_1 - f_0 - 2b\Delta - \tau}{2a} \end{cases}$$

The solutions of the system are:

$$G_0 = \frac{f_0(2a+1) - f_1(1-a) + 2b\Delta - 3\tau}{3a} \quad \text{and} \quad G_1 = \frac{f_1(2a+1) - f_0(1-a) - 2b\Delta - 3\tau}{3a}$$

The grading policies of the two universities critically depend on the fees charged. Three different solutions emerge for different values of  $f_1 - f_0$ . In the first region,  $f_0 > f_1$  and  $G_0 >$

$G_1$ , meaning that the two universities pursue different strategies to attract students. The university located in 0 use the vicious strategy made of high fees and high grades, while the university located in 1 use the virtuous strategy made of low fees and low grades. In the second region, where  $f_1 - f_0 > \frac{4b\Delta}{a+2}$  and  $G_0 < G_1$ , the strategies are inverted. The university located in 0 pursue the virtuous strategy unlike the university located in 1 that use the vicious strategy. In the third region, where  $0 < f_1 - f_0 < \frac{4b\Delta}{a+2}$  and  $G_0 > G_1$ , two different strategies emerge. The university located in 1 chooses an elitarian strategy with high fees, low grades, and few students. The university located in 0 chooses instead a predatory strategy made of low taxes and high grades, that attracts the large majority of students. The third region is more likely to occur the more students are interested in the socio-economic characteristics of the location and the less are interested in high grades.

#### **4. Discussion and conclusion**

Our model shows how can be simple to model the consequences of adopting soft grading policy on the students' decisions about departments where to apply, just allowing universities to interact competitively each other. Firstly, let us notice that the model is as conservative as possible, including high grades as a positive parameter in the students' utility function.

The model shows that grading inflation is a reaction to adverse conditions. In fact, soft grading policies can be intended as interventions by the departments aimed at balancing the distortions generated by different fees and differences in the socio-economic characteristics of the locations. Two different scenarios emerge, in the first one soft grading policies are substitutes of the policies on fees, while in the second one they are complements. We intend that when each of the two universities is more attractive in one of the two dimensions but less attractive in the other, then soft grading policies and fees are used as substitutes. Analogously when one university is more attractive in both the dimensions, then soft grading policies and fees are used as complements. In the first region identified in the previous section, the university located in 0 has both higher fees and worst socio-economic characteristics making it less attractive than the other. Soft grading policy is the strategy chosen by the departments of the university located in 0 to be more attractive and counter the negative effects of fees and socio-economic characteristics of the location 0. In the second region identified in the previous section the soft grading policy is implemented by the departments of the university located in 1. In fact, in this region the positive effect in terms of attractivity generated by the socio-economic characteristics is more than compensated by the negative effect generated by the large fees of the university located in 1. Also in this region fees and soft grading policies act like substitutes. In the third region identified in the previous section, the university located in 0 has lower fees but the positive effect in terms of attractivity is more than compensated by the negative effect of the socio-economic

characteristics of location 0. In this region fees and soft grading policies are instead complements, in fact the university located in 0 needs both soft grading policy and low fees to be attractive for students. As a special case we note that when the fees of the two universities are equal, the departments of the university in the bad location, in terms of socio-economic characteristics, implement soft grading policies. The larger is the difference in the quality of the location, the greater should be the difference in grading policies.

The take-away message of this model is that soft grading policies are a strategy to counter imbalances in the attractiveness of universities. While the socio-economic characteristics of the location are, at least in the short and medium term, out of the control of universities, fees are directly chosen by universities. In this type of model one instrument, fees, is enough to balance the attractiveness of the universities. We stress that in the model presented the two universities have the same quality in terms of teachers, services, and quality of the research. A possible extension of the model could consider the quality of university as linked to both fees and grading policies. On one side higher fees generate higher quality of services for students (Beine *et al.*, 2020), and on the other side that grade inflation is instead harmful for the quality of the university (Edwards, 2000). In this setting the effectiveness of soft grading policies would be severely reduced. In this setting grading policies have a direct positive effect on the preferences of students, but at the same time reduces the quality of the university and thus they have an indirect negative effect on preferences of students. When the second effect is larger grading inflation impairs the attractiveness of universities.

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